IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OKLAHOMA

STATE OF OKLAHOMA,	)	
	)	
Plaintiff,	)	
	)	
v.	)	**Case No. 05-cv-329-GKF(SAJ)**
	)	
TYSON FOODS, INC., et al.,	)	
	)	
Defendants.	)	

DECLARATION OF BERNARD ENGEL

I, Bernard Engel, Ph.D., state the following:

1. I hold a Ph.D. in Agricultural and Biological Engineering from Purdue University. Since 1988, I have been a faculty member in the Purdue University Department of Agriculture and Biological Engineering. I am currently Department Head and Professor within this program.

2. I have been retained by the Oklahoma Attorney General as an expert witness for the Plaintiff, State of Oklahoma ("State") in the above-captioned litigation. In particular, I prepared an expert report containing my opinions and evaluation concerning the generation and land application of poultry waste within the Illinois River Watershed ("IRW"), and the movement of this waste and its constituents into streams, rivers and groundwater within the IRW and Lake Tenkiller. This report was finalized—and the modeling materials provided—on or before May 22, 2008.

3. I provided working copies of environmental models and supporting files as part of my considered materials. The models and supporting files and materials were provided in an identical directory/folder structure as to that on my computers. I did not disassemble these materials. Access to the computers used for this effort would be intrusive and is unnecessary

EXHIBIT
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since the files have been provided as they are stored on these computers. These computers are used for multiple purposes and projects and thus contain personal information and data and information that is confidential to other projects and efforts.

3. The common use of the term "model" within the hydrologic/water quality modeling community would refer to the hydrologic/water quality model itself (e.g., HSPF, GLEAMS, SWAT) rather than the model plus input files that have been prepared to characterize a particular situation.

4. The models used in reaching the conclusions within my report are typical of the types of models used in hydrologic/water quality modeling of watershed systems such as the Illinois River Watershed. These models consist of an executable model file that uses numerous input files (tens or hundreds of input files in some cases) and produces one or more output files (tens or hundreds of files in some cases). A variety of watershed hydrologic/water quality models are available, including but not limited to those used by me.

5. Modification of the equations within the actual watershed model itself when applying a model for the purpose of calculating runoff or phosphorus loads from a watershed would not be standard practice. (I understand, however, that Dr. Wells as developer of the CE-QUAL_W2 lake/reservoir model sometimes modifies his model code when applying it.) Model input files are prepared based on data specific to the watershed of interest. These data files are external to the model itself. Parameters within the model input files are potentially modified during model calibration, but in watershed modeling the model code is typically *not* modified. To model hypothetical scenarios of interest, the model input files are modified to reflect the conditions of the hypothetical scenario. As is the standard practice in watershed modeling, the

equations within the hydrologic/water quality models used in preparing the results in my report *were not* modified.

6. The assumptions and calculations that I used or made *are not hidden* in the computer code. The hydrologic/water quality model that I used has been widely discussed in numerous publications. The model equations were not modified and thus the literature discussing the model describes the model assumptions – they are not hidden.

7. The peer review process for journal articles and agency reports routinely examines modeling studies or studies in which models play a significant role. In the peer review process, the models are not run by the reviewers at all whether to critique the models, model results, or otherwise. Further, the reviewers do not run the models to examine the effect of each assumption. The reviewers do not run the models at all in performing such reviews.

8. Literature that discusses various Illinois River Watershed (IRW) water quality and pollution issues contains significant IRW data and is readily available (state and federal agencies; journal articles; university studies). These studies advance various theories and contain significant data regarding the causes of water contamination within the IRW. This literature has been readily available to the defendants for use in their analysis and modeling of the IRW. As can be discerned from the list of materials I cited in my report, the majority of these reports have been available to the defendants, or any other interested parties, for many years.

9. A large amount of data for the IRW is freely and readily accessible from various sources (federal agencies, state agencies, reports). This includes key data for use in hydrologic/water quality modeling within the IRW are readily available and have been available

for many years. These include spatial data as well as other data such as water quality data. As set forth in more detail in Appendix D of my report, these include data such as the following:

- USGS flow data
- USGS P concentrations
- STATSGO soils
- National Elevation Dataset DEM
- National land use data cover
- Point source discharge data
- Weather

Using this publicly available data, the defendants could have created their own IRW hydrologic/water quality model beginning in 2005 when the case was first filed.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Bernard Engel, Ph.D.

June 30, 2008